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[FAD 7: Soil Quality and Gertilizers]



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IS : 7131 - 1973

Indian Standard

SPECIFICATION FOR NITROPHOSPHATE BASED
GRANULATED FERTILIZERS

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SPECIFICATION FOR NITROPHOSPHATE BASED GRANULATED FERTILIZERS

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(Continued on page 2)

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(Continued on page 10)

AMENDMENT NO. 1 NOVEMBER 2012
TO
IS 7131 : 1973 SPECIFICATION FOR
NITROPHOSPHATE BASED
GRANULATED FERTILIZERS

[*Page 5, clause 4.3(c)*] — Substitute ‘Net quantity of contents, and’ *for*
‘Net mass of contents, and’.

(FAD 7)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR NITROPHOSPHATE BASED GRANULATED FERTILIZERS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 10 November 1973, after the draft finalized by the Acids and Fertilizers Sectional Committee had been approved by the Chemical Division Council.

0.2 For particle size, the use of IS Sieves conforming to IS : 460-1962* is prescribed. Where IS Sieves are not available, other equivalent sieves as adjudged from aperture size may be used.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for nitrophosphate based granulated fertilizers.

2. GRADES

2.1 There shall be three grades of the material, depending on the content(s) of nitrogen; phosphorus and potash (N-P-K), namely :

- a) Grade 20-20-0
- b) Grade 15-15-15
- c) Grade 18-18-9

3. REQUIREMENTS

3.1 Particle Size — Not less than 90 percent by mass of the material shall lie between 1 mm and 4 mm size, when tested using 1 mm IS Sieve and 4 mm IS Sieve. The portion of the material passing through 500 micron IS Sieve shall be not more than 0.3 percent.

*Specification for test sieves (*revised*).

†Rules for rounding off numerical values (*revised*).

3.2 Shape of Granules — It is recommended that the granules shall be spherical, smooth and shall be free flowing through a fertilizer drill.

3.3 Resistance to Breakdown of Granules — A single granule of the material, taken from the size range 2.00 mm and 2.36 mm, shall resist a load of 1.0 kg, *Min*, when tested as prescribed in **A-1**.

3.4 Lump Formation — The material shall pass the test prescribed in **A-2**.

3.5 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR NITROPHOSPHATE BASED GRANULATED FERTILIZERS

| Sl. No. | CHARACTERISTIC | REQUIREMENT FOR | | | METHOD OF TEST, REF TO PART AND CLAUSE NO. IN IS : 6092*-1971 |
|---------|--|-----------------|----------------|---------------|---|
| | | Grade 20-20-0 | Grade 15-15-15 | Grade 18-18-9 | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| i) | †Total ammoniacal and nitrate nitrogen (as N), percent by mass, <i>Min</i> | 20.0 | 15.0 | 18.0 | 9 of Part II |
| ii) | Ammoniacal nitrogen (as N), percent by mass, <i>Min</i> | 10.0 | 7.5 | 9.0 | 11 of Part II |
| iii) | †Total phosphates (as P_2O_5), percent by mass, <i>Min</i> | 20.0 | 15.0 | 18.0 | 6 of Part III |
| iv) | Water-soluble phosphates (as P_2O_5), percent by mass, <i>Min</i> | 5.4 | 4.0 | 5.0 | 7 of Part III |
| v) | Citrate soluble phosphates (as P_2O_5), percent by mass, <i>Min</i> | 14.6 | 11.0 | 13.0 | 8 of Part III |
| vi) | Potash content (as K_2O), percent by mass, <i>Min</i> | — | 15 | 9 | 6, 7 or 8 of Part IV |
| vii) | Moisture, percent by mass, <i>Max</i> | 1.5 | 1.5 | 1.5 | 5.3 of Part VI |
| viii) | Free acidity (as H_2SO_4), percent by mass, <i>Max</i> | 1.0 | 1.0 | 1.0 | 7 of Part VI |
| ix) | Calcium nitrate, percent by mass, <i>Max</i> | 0.5 | 0.5 | 0.5 | 9 of Part VI |

*Methods of sampling and test for fertilizers:

Part II Determination of nitrogen

Part III Determination of phosphorus

Part IV Determination of potassium

Part VI Determination of impurities

†Tolerance of -0.5 units shall be permissible on these requirements.

4. PACKING AND MARKING

4.1 It is essential that the packing should be capable of providing adequate protection to the contents from absorption of moisture. Further, the packing should be physically strong enough to withstand the normal stresses of handling during stacking, transport and storage.

4.2 It is recommended that the fertilizer is packed in 50 kg packings.

4.3 The fertilizer packages shall be securely closed and marked with the following information:

- a) Name and grade of the material;
- b) (N-P-K) analysis of the material, N standing for total nitrogen content, P standing for total phosphorus (P_2O_5) content and K standing for total potash (K_2O) content. In addition, the water-soluble phosphorus (P_2O_5) content and citrate soluble phosphorus (P_2O_5) content shall also be shown;
- c) Net mass of contents and
- d) Name of the manufacturer and recognized trade-mark, if any.

4.3.1 The packages may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standards conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to the standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. HANDLING AND STORAGE

5.1 Factors to be borne in view in the handling and storage of the fertilizer shall be as prescribed in IS : 5985-1971*.

6. SAMPLING

6.1 The method for drawing representative samples of the material shall be as prescribed in IS : 6092 (Part I)-1972†.

6.2 Number of Tests — Tests for all the requirements given in 3 shall be conducted on the composite test sample.

*Code of practice for handling and storage of bagged fertilizers.

†Methods of sampling and test for fertilizers: Part I Sampling.

6.3 Criteria for Conformity — For declaring the conformity of the lot to the requirements of this specification, the test results on the composite test sample shall satisfy all the requirements specified in 3.

7. TEST METHODS

7.1 Tests for the requirements listed under 3 shall be carried out according to methods prescribed in Appendix A and in Parts II, III, IV & VI of IS : 6092-1971*.

APPENDIX A

(Clauses 3.3 and 3.4)

METHODS OF TEST FOR NITROPHOSPHATE BASED GRANULATED FERTILIZERS

A-1. TESTS FOR RESISTANCE TO BREAKDOWN OF GRANULES

A-1.0 General — Two methods are described here. The methods are used to determine comparative hardness of granules and applicable to granulated or pelleted forms of solid fertilizers. Any of the two methods may be used.

A-1.1 Method A

A-1.1.1 Apparatus

A-1.1.1.1 Hardness tester — as shown in Fig. 1.

A-1.1.2 Procedure

A-1.1.2.1 Collect a portion of the sample lying in the size range 2.00 mm and 2.36 mm. From the portion obtained pick out at random 25 granules.

A-1.1.2.2 Test each granule successively. Place each granule under the ratchet and slowly screw it down until the particle crushes. Note the crush point on the scale indicator and record the load required to crush it.

A-1.1.3 Calculation — Calculate in kg the mean of the 25 observations and report the results.

*Methods of sampling and test for fertilizers:
Part II Determination of nitrogen,
Part III Determination of phosphorus,
Part IV Determination of potassium,
Part VI Determination of impurities.

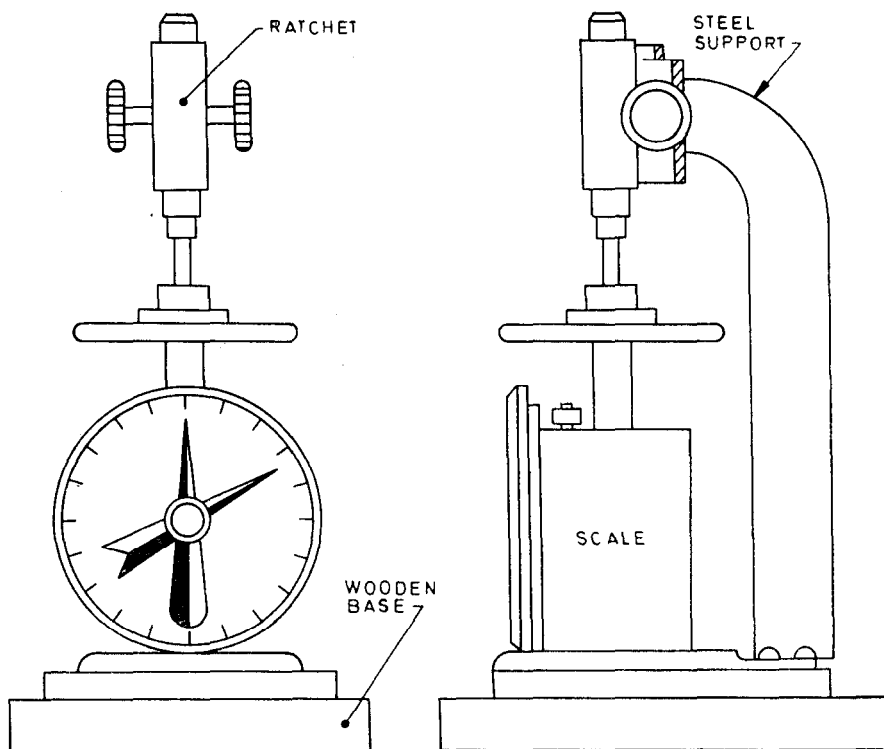
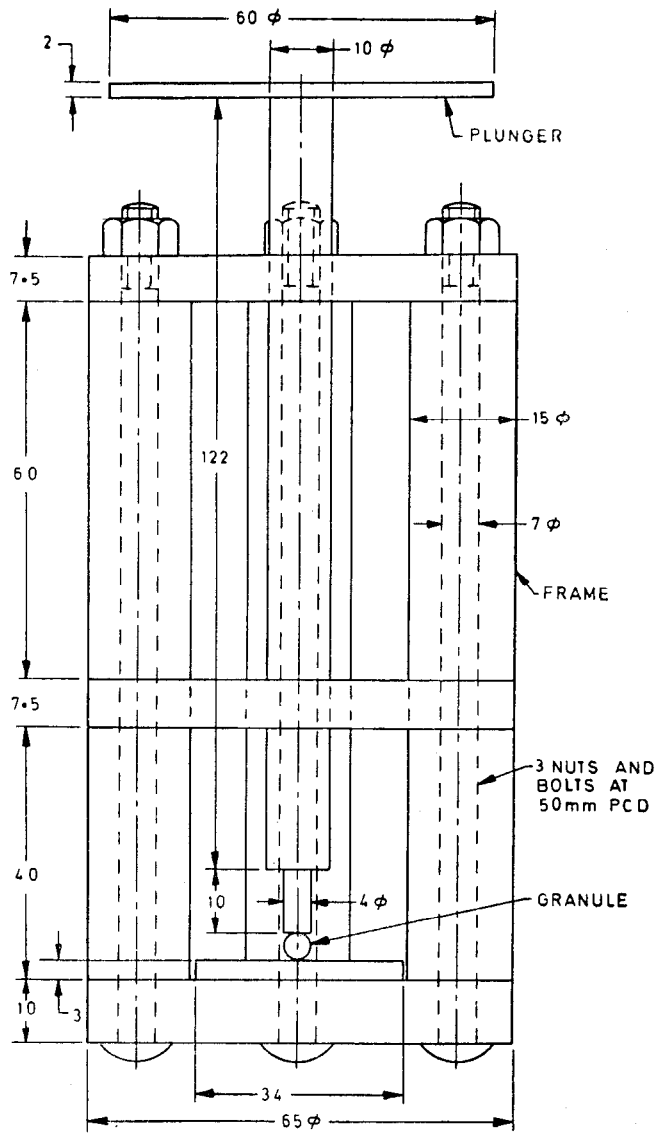


FIG. 1 HARDNESS TESTER, METHOD A

A-1.2 Method B

A-1.2.1 Apparatus — The apparatus, made of mild steel, is shown in Fig 2. It consists of two parts, namely a frame and a plunger. The frame is made of three circular plates and three rods fitted with nut and bolt. These rods are fitted vertically on the base plate and the other two plates are fixed tightly in position. Circular holes are made at the centre in these two plates as shown in Fig. 2 through which the plunger rod can pass through smoothly. The plunger weighing 150 g consists of a circular plate at the top (for keeping additional weights) and a narrow stem 'of diameter 4 mm' at the base which can rest either on the base plate or on the fertilizer granule.



All dimensions in millimetres.
FIG. 2 HARDNESS TESTER, METHOD B

A-1.2.2 Procedure

A-1.2.2.1 Collect a portion of the sample lying in the size range 2·00 mm and 2·36 mm. From the portion obtained pick out at random 25 granules.

A-1.2.2.2 Test each granule successively. Place each granule at the centre of the base plate and keep the stem of the plunger just on its top. Put additional weights on the top of the plunger incrementally and note the total weight of the plunger itself plus the additional weights at which the granule crushes.

A-1.2.3 Calculation — Calculate in kg the mean of the 25 observation and report the result.

A-2. TEST FOR LUMP FORMATION

A-2.1 Procedure — Store one 50-kg packing of the material under a weight equivalent to twelve 50-kg sample bags of the material for 7 days. Then drop the sample bag from a height of 1·5 metres on to hard concrete floor. Empty out the contents of the bag and determine the quantity of the material larger than 12 mm size with the help of a standard sieve.

A-2.2 The material shall be taken to have passed the test if not more than 5 percent of the material is larger than 12 mm in size.

(Continued from page 2)

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